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ABSTRACT

Learning strategies can be defined as behaviors and thoughts in which a learner engages and which are intended to influence the learner's encoding process. Thus, the goal of any particular learning strategy may be to affect the way in which the learner selects, acquires, organizes, or integrates new knowledge. Good teaching includes teaching students how to learn, remember, think, and motivate themselves. Teachers enter the classroom with two distinctly different kinds of goals which are teaching students "what" to learn and teaching students "how" to learn. Some major categories of learning strategies are: (1) rehearsal strategies such as copying, underlining, or shadowing; (2) elaboration strategies such as paraphrasing or summarizing; (3) organizational strategies such as outlining or creating a hierarchy; (4) comprehension monitoring strategies such as checking for comprehension failures; and (5) affective strategies such as being alert and relaxed. Many current approaches to classroom learning emphasize the role of the learner in creating, monitoring, and controlling a suitable learning environment. Learning strategies research, by providing strong evidence that these learning strategies can be taught, is creating a useful data base from which applications can and will be derived. (EM)

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THE TEACHING OF LEARNING STRATEGIES

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THE TEACHING OF LEARNING STRATEGIES

Learning strategies can be defined as behaviors and thoughts in which a learner engages and which are intended to influence the learner's encoding process. Thus, the goal of any particular learning strategy may be to affect the learner's motivational or affective state--or the way in which the learner selects, acquires, organizes, or integrates new knowledge. For example, in preparing for a learning situation, a learner may use positive self-talk to reduce feelings of anxiety; in learning paired-associates, a learner may form a mental image to help associate the objects represented by the members of each pair; in learning from an expository passage, a learner may generate summaries for each section; in learning about a scientific concept, a learner may take notes about the material. Each of these activities--coaching, imaging, summarizing, and notetaking--is an example of a learning strategy.

Good teaching includes teaching students how to learn, how to remember, how to think, and how to motivate themselves. Norman summarizes this argument:

> It is strange that we expect students to learn yet seldom teach them about learning. We expect students to solve problems yet seldom teach them about problem solving. And, similarly, we sometimes require students to remember a considerable body of material yet seldom teach them the art of memory. It is time we made up for this lack, time that we developed the applied disciplines of learning and problem solving and memory. We need to develop the general principles of how to learn, how to remember, how to solve problems, and then to develop applied courses, and then to establish the place of these methods in an academic curriculum.

Helping students develop effective ways to handle the barrage of information coming from the environment, as well as handle their own thinking processes, is a major--and increasingly important--goal of our educational system.

Implications for Teachers

This change in approach has important implications for teachers. Teachers enter the classroom with two distinctly different kinds of goals: (1) *goals concerning the products of learning*, which focus on what students should know or be able to do as a result of learning--that is, goals that focus on teaching *what* to learn; and (2) *goals concerning the processes of learning*, which focus on techniques and strategies students can use to accomplish learning--that is, goals that focus on teaching *how* to learn. Successful teaching requires sensitivity to both types of instructional goals and skill in teaching both types of instructional objectives. Learning is an active process that occurs within the learner and that can be influenced by the learner.

Some Major Categories of Learning Strategies

Rehearsal strategies for complex learning tasks, such as copying, underlining, or shadowing the material presented in class. Common tasks in this category include underlining the main events in a story or copying portions of a lesson about the causes of World War I.

When the material to be learned is prose--such as reading from a science textbook, the rehearsal strategies can include repeating the material aloud (i.e., shadowing), copying material, taking selective verbatim notes, and underlining the important parts of the material. For each strategy, the act of rehearsal involves the learner actively in saying, writing, or pointing to parts of the presented material during learning. Two of the major cognitive goals of this strategy are selection--helping the learner to pay attention to important aspects of the passage, and acquisition--making sure that the material is transferred into working memory for further study. Another form of rehearsal is to copy or underline only the important parts of an assignment. For example, Rickards and August found that students who were asked to underline sentences in a passage were able to recall substantially more information than students who simply read the passage without underlining.

Notetaking is probably the most common form of complex rehearsal strategy. Peper and Mayer studied notetaking as a generative activity. Mayer asked college students to read a manual on a computer programming language. After each section in the manual, some subjects were asked to explain how that material related to material in another section of the manual (or to a familiar situation). These subjects performed better on tests of creative problem-solving using the new language than did those subjects who simply read the manual without answering elaboration questions.

Elaboration strategies for complex tasks, such as paraphrasing, summarizing, or describing how new information relates to existing knowledge. Common tasks in this category include creating an analogy between the operation of a post office and the operation of a computer, or relating the information presented about the structure of complex molecules to the information presented about the structure of simple molecules.

When elaboration strategies are applied to such tasks as prose learning, the activities can include paraphrasing, summarizing, creating analogies, generative notetaking, and question answering. The goals of these techniques include *integration* of presented information with prior knowledge--i.e., transferring knowledge from long-term memory into working memory and integrating the incoming information with this knowledge.

Organizational strategies for complex tasks, such as outlining a passage or creating a hierarchy. Common tasks in this category include outlining assigned chapters in the textbook or creating a diagram to show the relationship among the stress forces in a structural design.

Students in the upper elementary grades, high school, and college spend a significant amount of time studying from textbooks. Part of a student's text reading task is to identify the main ideas and important supporting details and to relate these to one another in a way that will facilitate encoding and recall. Outlining and organizing the material are commonly used to achieve these goals. Thus, two cognitive goals served by organizational strategies are selection of information to be transferred into working memory and construction of relations among ideas in working memory.

Mayer has referred to this encoding process as "building internal connections." The building of internal connections may be enhanced by explicit training in strategies for outlining and organizing items in meaningful learning tasks, such as training in the types of structural relations among ideas in a passage. Training in organizing strategies may be most important for expository prose since most students have had much more experience in reading narrative prose.

Outlining is a type of organizational strategy that has traditionally received much attention. In topic outlining, major and minor points are written in an abbreviated form using key words or phrases. In symbolic outlines--such as arrays--key concepts, words, or phrases are functionally related in a two-dimensional diagram.

Comprehension monitoring strategies, such as checking for comprehension failures. Common tasks in this category include using self-questioning to check understanding of the material presented in class and using the questions at the beginning of a section to guide one's reading behavior while studying a textbook.

Comprehension monitoring requires that the student establish learning goals for an instructional unit or activity, assess the degree to which these goals are being met, and, if necessary, modify the strategies being used to meet the goals. Comparisons of good and poor comprehenders have consistently shown that poor comprehenders are deficient in the use of active learning strategies needed to monitor understanding.

Affective strategies, such as being alert and relaxed, to help overcome test anxiety. Common tasks in this category include reducing external distractions by studying in a quiet place or using thought stopping to prevent thoughts of doing poorly from directing attention away from the test and toward fears of failure.

Many current approaches to classroom learning emphasize the role of the learner in creating, monitoring, and controlling a suitable learning environment. Research in this area has focused on the strategies learners use to focus attention, maintain concentration, manage performance anxiety, establish and maintain motivation, and manage time effectively. Studies examining performance, or test, anxiety are prototypical of the research in this area.

Learning strategies research--by providing strong evidence that these learning strategies *can* be taught--is creating a useful data base from which applications can and will be derived. As this literature continues to mature and develop, the implications for classroom teaching, educational practice, and educational research will continue to expand.

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For further information, contact the authors about this chapter by the same title in Wittrock, M.C. (Ed.), *Handbook of Research on Teaching, Third Edition.* New York: Macmillan, in press.

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